

# San Diego Regional HOV/Managed Lanes Systems Planning and Implementation Guide

**August 24, 2016**  
**Planning Horizons**



# Study Goals

- Provide a uniform and consistent approach for the evaluation of existing freeway facilities to determine the appropriate HOV/managed lane strategies;
- Provide practitioners and owners with a consistent and coordinated way of applying managed, HOV and HOT lanes to San Diego freeways to ensure a seamless motorist experience in a network of managed lanes; and
- Address both planning and design issues that can be applied to the freeway corridors in the region

# Agenda

1. Background on Managed Lanes and Pricing
2. Key Policy Issues for San Diego
3. Managed Lanes Study – What Have We Learned?
4. Recommendations for Policy and Project Delivery
5. Questions and Discussion



## Two Things to Take Away...if nothing else...

- 1. Pricing HOV lanes is a good idea, even if there is only one lane**
- 2. We should build HOV lanes that are “toll ready”**



# Background on Managed Lanes and Pricing

***Let's start with some definitions and general background....***

# Common Language

**Tolling** and **pricing** both involve the act of collecting money from roadway users

## Tolling

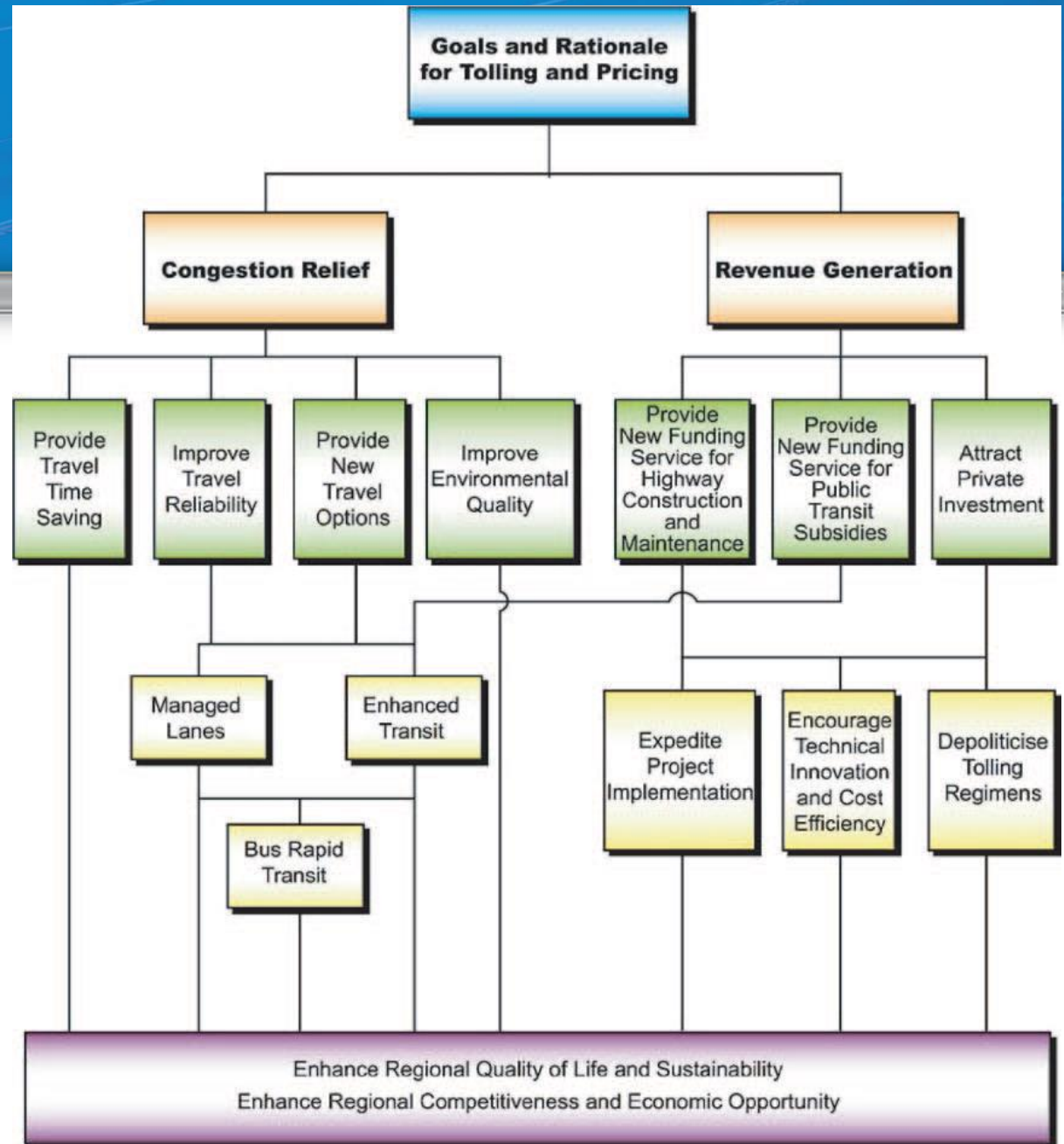
- Assessment of a fixed fee for the use of a roadway to all users
- Primarily used as revenue source to finance and expedite implementation of projects

## Pricing

- Vary toll rates by time of day or volume of traffic
- Manage congestion
- Maximize person throughput

**Source: NCHRP 722 – Assessing Highway  
Tolling and Pricing Options and Impacts –  
November 2012**

# Two General Goals

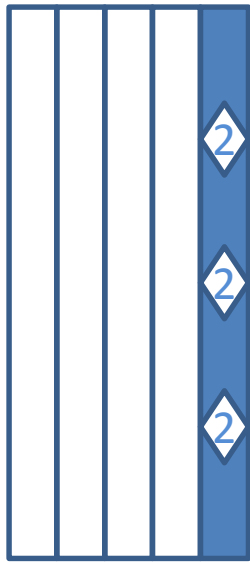


# Tools to Regulate Flow on Managed Lanes

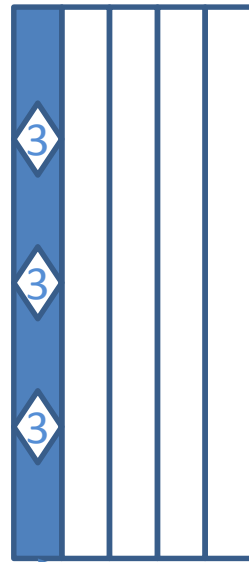
- **Pricing** – user fees regulate demand (“managed lanes”)
- **Occupancy** – minimum number of vehicle occupancy usually HOV-2 or HOV-3
- **Eligibility** – limit use to certain user types such as HOV, motorcycles, low emission vehicles or trucks
- **Access** – limiting ingress to the lane or spacing access so demand does not overwhelm capacity



# ML and HOV Nomenclature

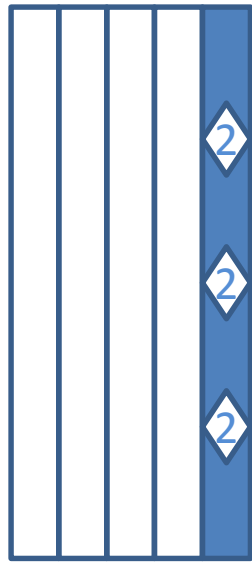


HOV-2: Only carpools with 2+ passengers are allowed (could also be two lanes in each direction).

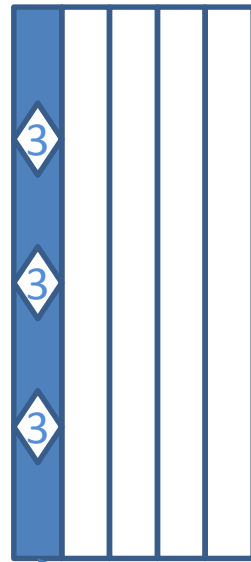


HOV-3: Only carpools with 3+ passengers are allowed

# ML and HOV Nomenclature



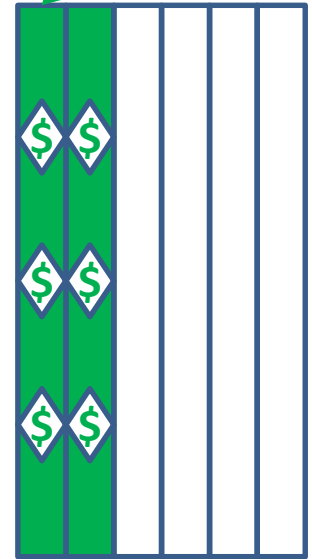
HOV-2: Only carpools with 2+ passengers are allowed (could also be two lanes in each direction).



HOV-3: Only carpools with 3+ passengers are allowed

2ML-3 (or ML-3): Two lanes (one in each direction); SOVs and HOV-2s can use if they pay a toll; carpools with 3+ passengers are free.

4ML-2 (or ML-2): Four lanes (two in each direction); SOVs can use if they pay a toll; carpools with 2+ passengers are free



# HOV-Managed Lanes System Development

- 2050 Regional Transportation Plan Vision
- TransNet Early Action Projects
- Maximum Person Throughput via HOV lanes and Bus Rapid Transit supportive infrastructure (DAR's, BRT stations, free-flow lanes)

# Short-Term HOV/ML Projects

- Early Action Projects (EAP): Freeways

## Legend

- Direct Access Ramp (DAR)
- Ⓢ HOV Connector
- HOV/ML
- Toll Lane

0 2.5 5 10 Miles



# Short-Term HOV/ML Projects

- EAP:  
BRT and  
Freeway  
Projects

## Legend

- Direct Access Ramp (DAR)
- Bus Rapid Transit Center (BRTC)
- HOV Connector
- BRT Freeway Segment
- HOV/ML
- Toll Lane

0 2.5 5 10 Miles





# Horizon HOV/ML Projects

- BRT on Freeway Segments
- EAP Freeway Projects
- EAP 2 etc.
- Toll Roads



# Corridor Approach: Focused Case Studies

- Multiple Projects
- Different Phases (PID to Construction)
- Different Issues
  - Access
  - Operations
  - Tolling
  - Infrastructure
- Common Ground: What Do We Do Next?



## National Examples

***What have we learned from others?***

# Rapid Deployment of Managed Lanes in the U.S.

- **Nationally, as of May 2012:**
  - 14 operating managed lane facilities
  - 14 in construction
  - approximately 25 others in planning
  - Early adopters have had success and are moving ahead with other projects (Washington state)
  - Big, connected systems are coming (Northern Virginia)
- **California**
  - San Diego: I-15
  - Orange County: SR 91
  - LA: I-10 and I-110
  - Bay Area: I-680, SR 237/I-880



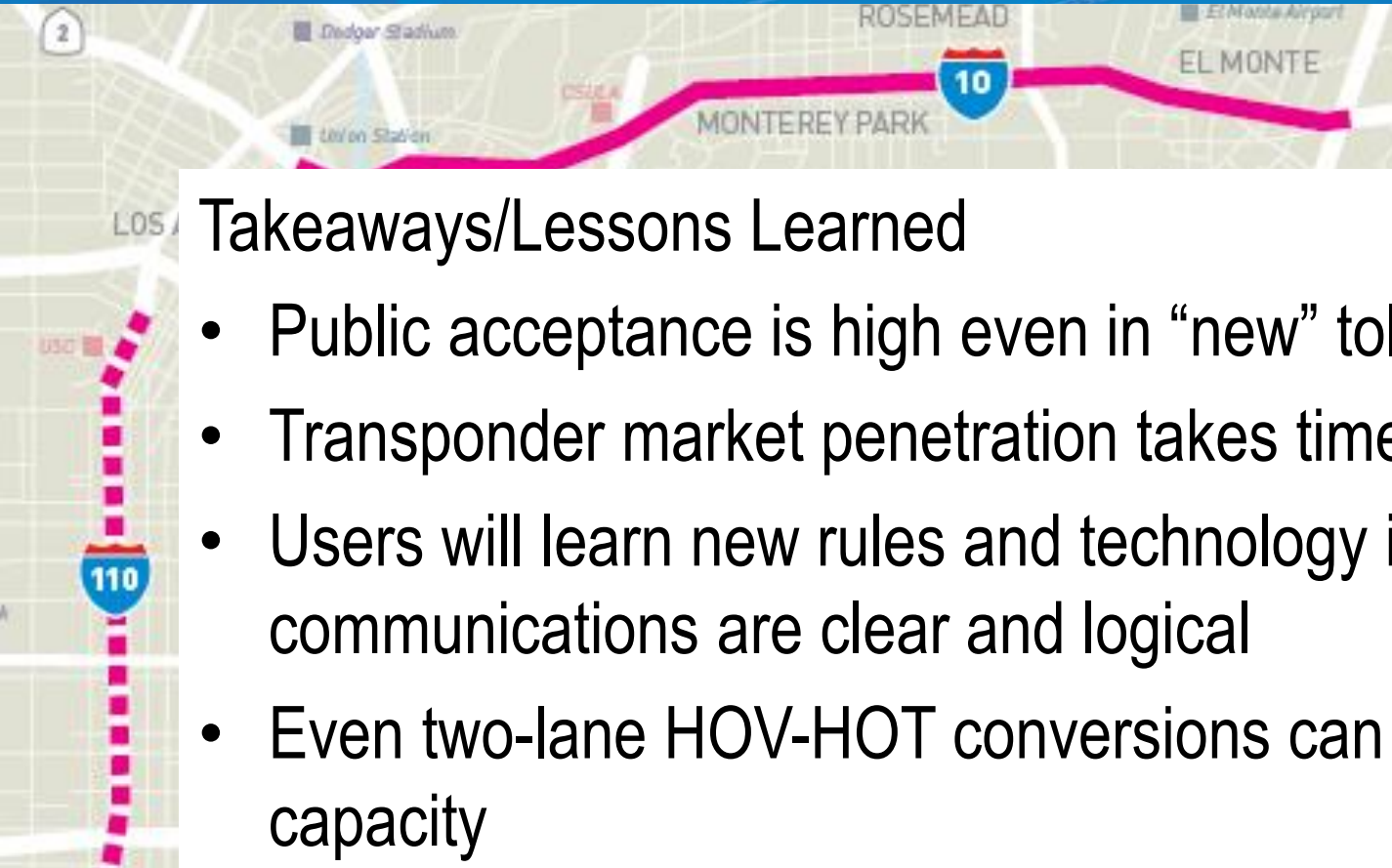
# Los Angeles Express Lanes – HOV Conversion

- Convert HOV to ML (minimal added capacity)
- I-110 Harbor Freeway (November 2012)
  - HOV-2+ free on I-110, 33 lane-miles
- I-10 Santa Monica Freeway (Winter/Spring 2013)
  - HOV-3+ free (2+ off peak) - 28 lane-miles
- Express Lane Operations
  - \$0.25 to \$1.40 per mile (to ensure 45 mph)
  - Four lanes, except transitions at I-110 transit stations
  - Reduced shoulder widths and enforcement areas
  - All transponders, backup electronic plate readers
  - Sensys detectors for speed monitoring





# Los Angeles Express Lanes – HOV Conversion



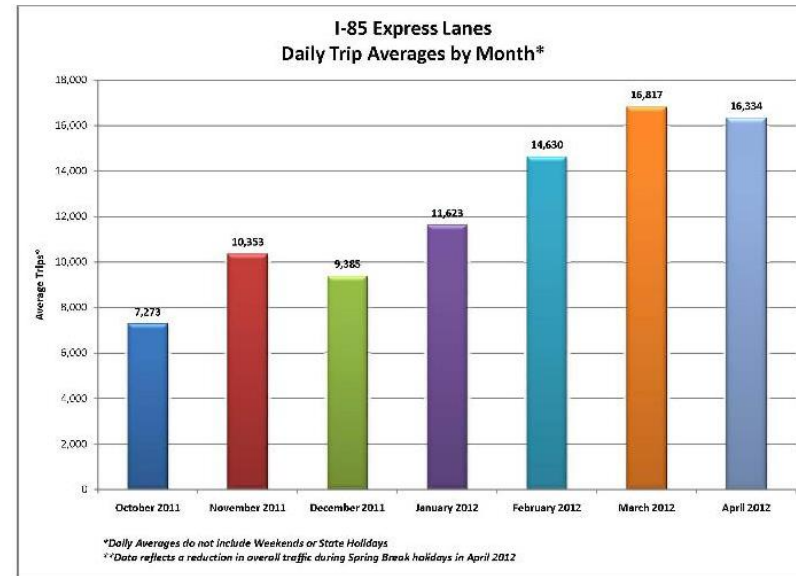
## Takeaways/Lessons Learned

- Public acceptance is high even in “new” toll areas
- Transponder market penetration takes time
- Users will learn new rules and technology if communications are clear and logical
- Even two-lane HOV-HOT conversions can reach capacity



# I-85 Express Lanes (Georgia) - Controversy

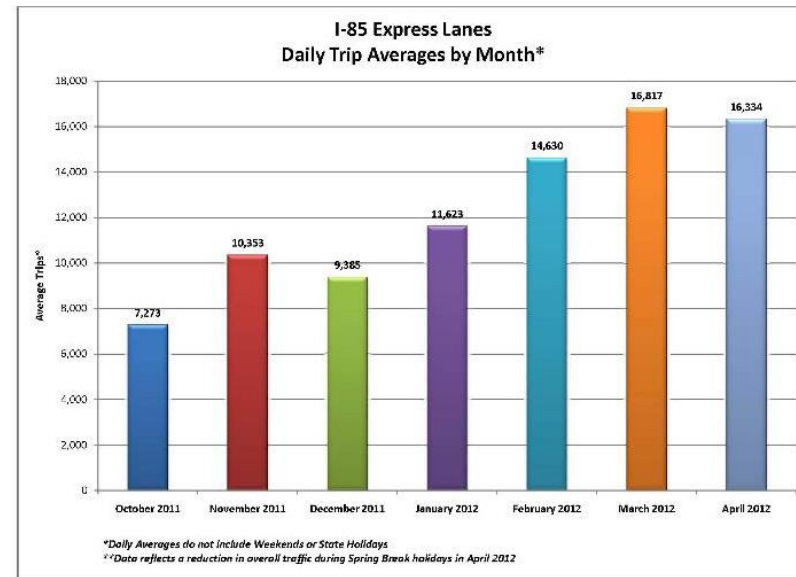
- Converts 16 miles of HOV lanes into Express Lanes (HOV-2 to 2ML-3)
- Requires a transponder, even for HOV-3
- Rates calculated dynamically
- Clearly expressed public concern
  - tolled HOV-2s (previously free)
  - cost of the new lanes
  - the level of congestion on the GP lanes
- Governor ordered adjustments to the system three days later - tolls were reduced by approximately 40 percent
- Request to FHWA for free HOV-2 was denied



# I-85 Express Lanes (Georgia) - Controversy

## Takeaways/Lessons Learned

- HOV-2 -> ML-3 conversions are challenging
- Operations issues can “go political” quickly
- Traffic demand takes time to find its true level



# Key Policy Issues for the San Diego Region

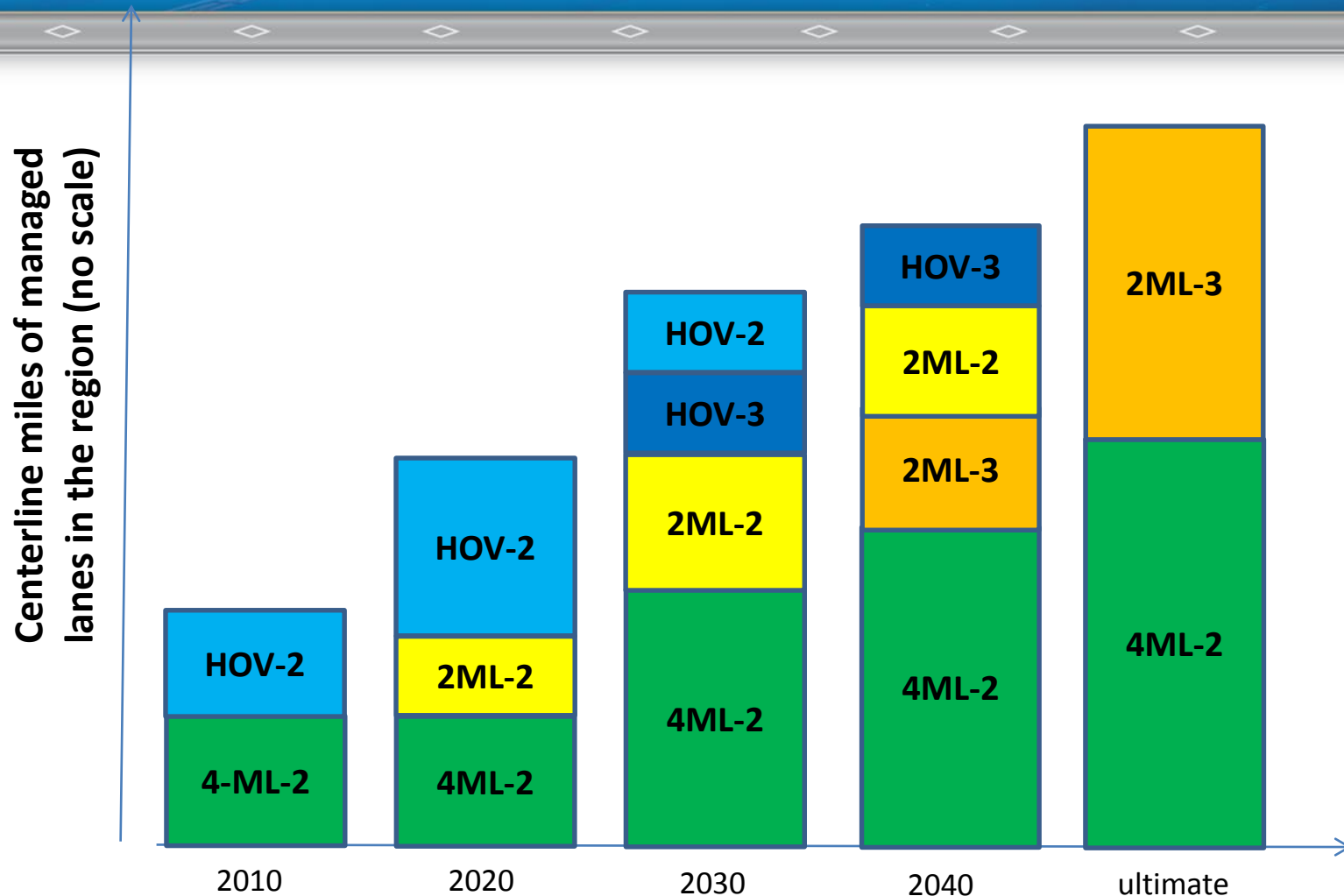
***How are regional policy and the realities of implementation related?***

# Regional Transportation Plan Direction

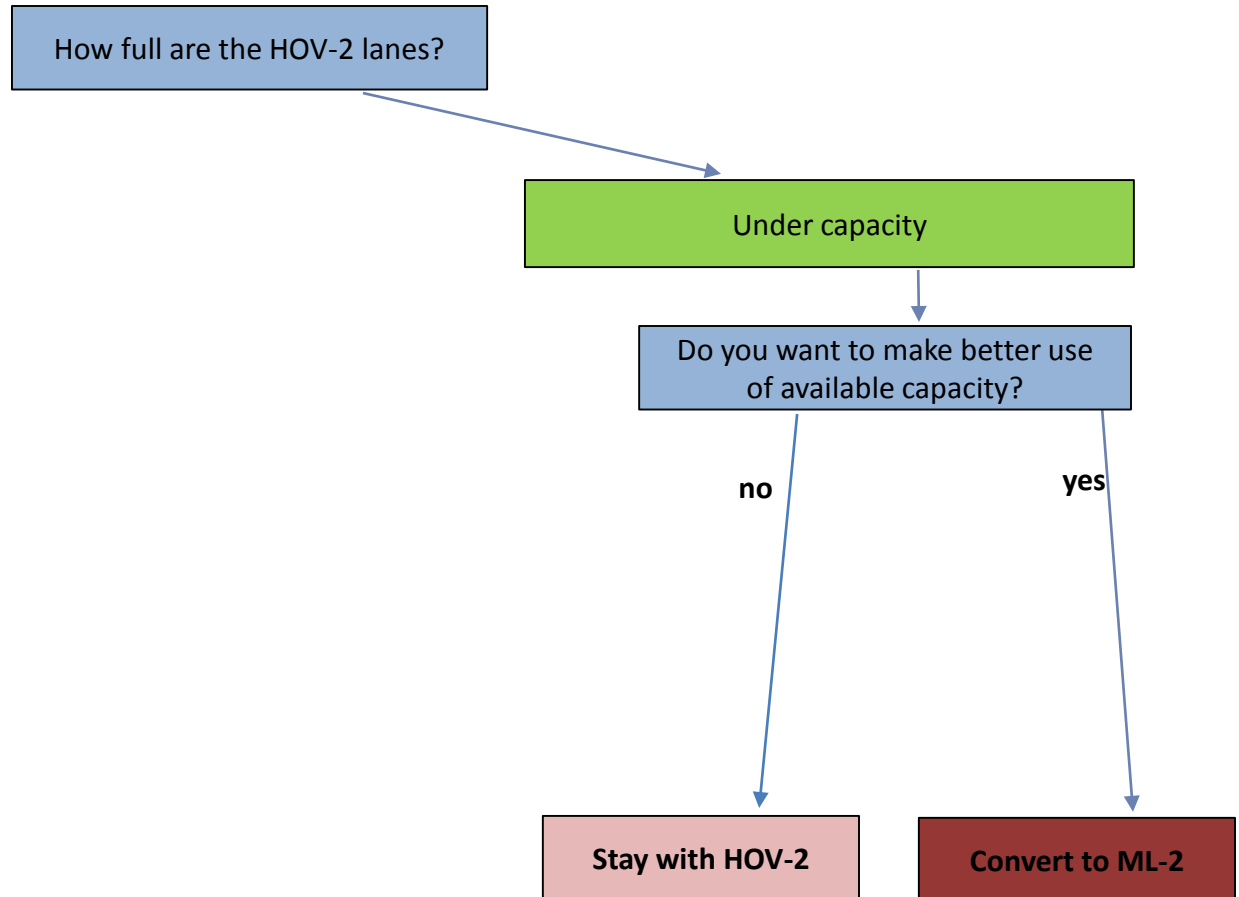
- General desire to “manage” facilities and maximize person throughput
- Build out the system over time
- Open questions:
  - When? Can all HOV lanes be converted?
  - Where? Which corridors need to be managed actively?
  - How? HOT vs. Active Traffic Management



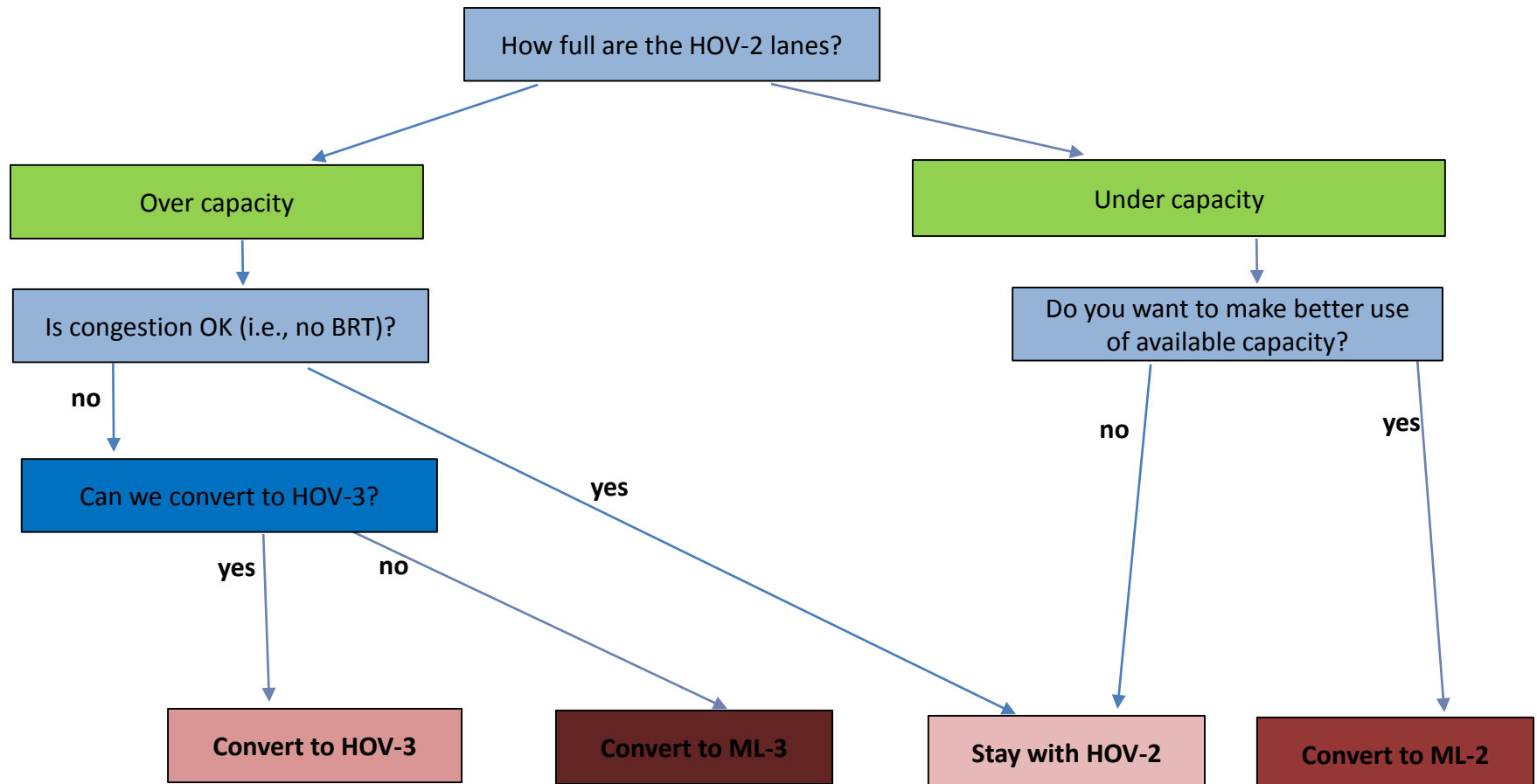
# The Mix of HOV/MLs Will Change Over Time



# The Choice to Convert from HOV-2 to ML is a Complex Decision (and Requires Good Modeling Data)



# The Choice to Convert from HOV-2 to ML is a Complex Decision (and Requires Good Modeling Data)



# Policy Strategies for Managed Lanes

- **Selling Excess Capacity (ML-2):**

If there is unutilized capacity – allow SOV using variable pricing like I-15 ML

Potential corridors:

- Initial SR94 with SR 94/I-805 Connector only
- SR78/I-15 HOV Connector

# Policy Strategies for Managed Lanes

- **Managing Congestion (ML-3):**

If there is overutilization - limit access to certain HOV users like LA 10/110

Potential Corridors:

- I-5 NCC HOV extension to SR 78
- I-805 South HOV lanes, Palomar to SR 94
- Ultimate SR 94 with connection to I-15 and east county



# HOV-2 to 2ML-3 Conversions are Challenging

- **Better to Go Straight to 2ML-3 Then Convert From 2HOV-2**
  - Deciding to change to HOV3+ is big deal regardless
  - Or invest in the 4ML ultimate project
- Other Options when “Converting” (Policy Decisions)
  - *Require registration of carpool vehicles to allow HOV lane use to eliminate “casual” carpools*
  - *Require transponders for all vehicles*
  - *Carpools must be adults*
  - *Use different pricing for non-compliant vehicles, typically HOV-2 (less) and SOV (more)*

# Managed Lanes Study – What Have We Learned?

***There are two main takeaways:***

- 1. Pricing HOV lanes is a good idea,  
even if there is only one lane**
- 2. We should build HOV lanes that  
are “toll ready”**

# Two Things to Take Away

1. Pricing HOV lanes is a good idea, even if there is only one lane.
  - National experience is positive
  - Key decision:
    - Are we selling excess capacity, or managing congestion?
  - Each corridor is unique – we shouldn't clone I-15
    - HOV demand and congestion change by time of day (day of week)
    - Geometry and right-of-way constraints (DAR's)
    - Transit service (BRT on facility or parallel rail service)

# Two Things to Take Away

2. We should build HOV lanes that are “toll ready”
  - Managed lanes require data and infrastructure
  - Fiber Optic Communication
  - Power for field elements
  - Vehicle detection
  - Video monitoring
  - Signs – Changeable info and tolling
  - Future toll gantries (if it makes sense)
  - Use new checklist to help us

# Recommendations for Implementation: “Manageable Lanes”

- A toll readiness checklist was developed to identify design elements and related considerations.
- Intermediate Access Points (IAP's) must be analyzed for each freeway segment/interchange/corridor.
- Phasing and operational decisions are unique to each corridor, but must be developed consistently with connecting corridors.





## Questions and Discussion